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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/678,531

10/03/2003

Jeong-Hoon Ahn

9898-270

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20575

7590

10/07/2005

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EXAMINER

WILSON, ALLAN R

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/678,531	Applicant(s) AHN ET AL.	
	Examiner Allan R. Wilson	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-3,5-7,12-17,19-22,24-28 and 52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-17,21,22 and 24-28 is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,19,20 and 52 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0805</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Amendment to the claims filed August 24, 2005 does not comply with 35 C.F.R. § 1.121 (no underlining of all added text), however the Amendment has been entered and the Examiner has proceeded with the following action.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 19 is rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 depends on claim 8 which has been cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 1, 2, 6 and 7 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,784,478 to Merchant et al. ("Merchant," of record).

With regards to claim 1, Merchant illustrates in figures 1-6 (entire document), particularly figure 1, a first electrode region of a first stair-stepped metal layer 34; a contact region 44 of the first stair-stepped metal layer; a second electrode of a second metal layer 30 that is closer to the substrate 6 than the first stair-stepped metal layer; a dielectric layer 32 intermediate the first electrode region and the second electrode, the dielectric layer including a contact opening therethrough in the vicinity of the contact region, wherein the first stair-stepped metal layer in a stair-stepped region thereof steps laterally and downwardly across the dielectric layer and into and at least partway laterally across the contact opening; and a wire 19, 22 electrically coupled to a bottom surface of the contact region of the first stair-stepped metal layer through the contact opening in the dielectric layer, wherein the first electrode region is electrically coupled to the wire through the contact opening in the dielectric layer.

With regards to claim 2, Merchant illustrates in FIGs. 1-6 the wire 19, 22 is formed of a third metal layer 19 that is closer to the substrate 6 than the second metal layer 30.

With regards to claim 6, Merchant illustrates in FIGs. 1-6 the wire 19, 22 has a planarized top surface.

With regards to claim 7, Merchant illustrates in FIGs. 1-6 the wire 19, 22 comprises a damascene layer.

Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by US 6,365,954 to Dasgupta (of record). Regarding claim 20 Dasgupta illustrates in figure 3 (entire document) a

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first metal layer including a bottom electrode 325 and an electrode contacting line 340; a top electrode 330 formed in a second metal layer, the top electrode disposed over the bottom electrode; a dielectric layer 365 separating the bottom electrode from the top electrode; a contact formed between the electrode contacting line and a bottom side of the top electrode; and a second contact located on a top side of the bottom electrode connected to contacting line 345.

Claim 52 is rejected under 35 U.S.C. 102(b) as being anticipated by US 6,184,567 to Fujisawa et al. (of record, hereinafter "Fujisawa"). Regarding claim 52, Fujisawa teaches in figures 8 and 16, a capacitor 10 formed on a substrate 43 comprising;

- a first electrode 22 of a first metal layer (col. 3, line 34);

- a second electrode 18 of a second metal layer (col. 3, line 27) that is closer to the substrate 102 than the first metal layer;

- a dielectric material 20 between the first and second electrodes; and

- a wire 32 coupled to a bottom surface of the first electrode,

wherein the first electrode is coupled to the wire through a contact hole in the dielectric material 20 (as seen in figure 8, a contact hole is formed in dielectric 20 so that electrical contact is made between wire 32 and electrode 22).

Regarding claim 52, the wire 32 of Fujisawa may be considered formed in a first metal layer, the bottom electrode 18 in a second layer and the top electrode 22 in a third layer such that the top electrode 22 couples to the contacting line 32 through a contact hole in the dielectric, the contact hole having a vertical:horizontal aspect ratio of less than about 1:1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of Merchant as applied above in view of US 6,800,923 to Yamamoto. Merchant taught the devices of claim 1 but did not expressly teach a plurality of separate contact holes. Yamamoto teaches, with reference to figure 1, an electrode 6 and a wiring layer 14 which are connected by a plurality of contact holes 12. Merchant is combinable with Yamamoto because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form a capacitor device with a plurality of contact holes as taught by Yamamoto. The motivation for doing so, as is taught by Yamamoto, is that a greater number of holes allows for rapid charging/discharging of the capacitor (col. 5, lines 5-12). Therefore, it would have been obvious to combine Merchant with Yamamoto to obtain the invention of claim 5.

Allowable Subject Matter

Claims 12-17 and 21-28 are allowed.

Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

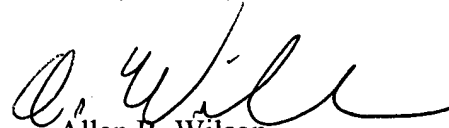
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is (571) 272-1738. Examiner Wilson can normally be reached 7:00-4:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan R. Wilson
Primary Examiner
5 October 2005